Space Weather Forecast

Issued on Sunday, 20 March 2022 at 12:38 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Reduced risk of Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar Activity has been Low over the past 24 hours, with two minor Common-class flares. One originating from AR2965 (which has now rotated off the visible disc) in the northwest quadrant. The second flare originated from a small and simple sunspot in the north, just east of the meridian, which peaked at C4.6 at 20/0745UTC. There was a filament eruption associated with the latter flare, which may produce a coronal mass ejection (CME), although awaiting imagery for further analysis. There are currently two newly numbered sunspots on the visible disc. New region AR2972 in the southeast is a Cro/Beta, which has shown some growth in its intermediate spots. AR2973 in the northeast has continues to emerge and has been classified as a simple Bxo/Beta configuration. There are also two unnumbered sunspots on the disc, which are small and simple at present.

No Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: Solar winds remained at background levels. The Interplanetary Magnetic Field (IMF) was weak, though increased towards the end of the period, with the north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be at mostly Low or Very Low levels, with the reduced risk of M-class flares with 2965 now rotated off the disc in the northwest.

Solar Wind / Geomagnetic Activity: Solar winds, currently at background levels, are expected to increase on day 1 (20th March) to perhaps 400-450 km/s, possibly due to a fast wind from a coronal hole, although this is low confidence.

Geomagnetic activity is expected to be mostly Quiet to Unsettled (Kp 1-3) to start. The fast wind arrival may give the slight chance of Active (Kp 4) intervals on Day 1 (20 March), although confidence is low. From days 2-4 (21-23 March) geomagnetic activity is expected to return to predominantly quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	2	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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